

## BEST AVAILABLE COPY

## INTERNATIONAL SEARCH REPORT

Int. national Application No

PCT/EP 00/01468

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07K14/21 C12N15/00 C07K16/12		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 7 C07K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) WPI Data, EPO-Internal, STRAND, BIOSIS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	S. SETHI ET AL: "Serum antibodies to outer membrane proteins (OMPs) of Moraxella (Branhamella) catarrhalis in patients with Bronchiectasis: Identification of OMP B1 as an important antigen" INFECTION AND IMMUNITY, US, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, vol. 63, no. 4, April 1995 (1995-04), pages 1516-1520-1520, XP002124643 ISSN: 0019-9567 cited in the application the whole document --- -/--	17-24
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
Date of the actual completion of the international search 29 June 2000		Date of mailing of the international search report 07/07/2000
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Panzica, G

## INTERNATIONAL SEARCH REPORT

Int. Application No  
PCT/EP 00/01468

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MYERS L E ET AL: "The transferrin binding protein B of Moraxella catarrhalis elicits bactericidal antibodies and is a potential vaccine antigen"</p> <p>INFECTION AND IMMUNITY, US, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, vol. 66, no. 9, September 1998 (1998-09), pages 4183-4192, XP002120409 ISSN: 0019-9567 the whole document</p> <p>---</p>	17-24
A	<p>HELMINEN ET AL: "A large, antigenically conserved protein on the surface of Moraxella catarrhalis is a target for protective antibodies"</p> <p>JOURNAL OF INFECTIOUS DISEASES, US, CHICAGO, IL, vol. 170, no. 4, 1 October 1994 (1994-10-01), pages 867-872, XP002079322 ISSN: 0022-1899 the whole document</p> <p>---</p>	17-24
A	<p>HELMINEN M E ET AL: "HUMAN IMMUNE RESPONSE AGAINST OUTER MEMBRANE PROTEINS OF MORAXELLA (BRANHAMELLA) CATARRHALIS DETERMINED BY IMMUNOBLOTTING AND ENZYME IMMUNOASSAY"</p> <p>CLINICAL AND DIAGNOSTIC LABORATORY IMMUNOLOGY, US, AMERICAN SOCIETY FOR MICROBIOLOGY, vol. 2, no. 1, 1 January 1995 (1995-01-01), pages 35-39, XP002048788 ISSN: 1071-412X the whole document</p> <p>---</p>	17-24
A	<p>WO 98 28333 A (COPE LESLIE D ;HANSEN ERIC J (US); AEBI CHRISTOPH (US); FISKE MICH) 2 July 1998 (1998-07-02) abstract claims</p> <p>---</p>	17-24
A	<p>WO 98 06432 A (UNIV NEW YORK) 19 February 1998 (1998-02-19) abstract claims</p> <p>-----</p>	17-24

# INTERNATIONAL SEARCH REPORT

Information on patent family members

In. ational Application No

PCT/EP 00/01468

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9828333 A	02-07-1998	AU 5720198 A CN 1251611 A EP 0948625 A	17-07-1998 26-04-2000 13-10-1999
WO 9806432 A	19-02-1998	US 6004562 A AU 4075797 A	21-12-1999 06-03-1998

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

SOUTHAMPTON

19 JUL 2001

BEST AVAILABLE COPY

PCT

To:

MALLALIEU, Catherine  
D. Young & CO.  
21 New Fetter Lane  
London EC4A 1DA  
GRANDE BRETAGNE

MONEY £	
ORDER	P/10605.00
ENTRY	
REC'D	19 JUL 2001
ANISO	
ENTRY	
FOR	ES CLM

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

Date of mailing  
(day/month/year)

17.07.2001

Applicant's or agent's file reference  
P010605WO CLM SZM

**IMPORTANT NOTIFICATION**

International application No.  
PCT/EP00/01468

International filing date (day/month/year)  
23/02/2000

Priority date (day/month/year)  
26/02/1999

Applicant

SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. +49 89 23399 - 0 Tx: 523656 epmu d  
Fax: +49 89 23399 - 4465

Authorized officer

Hingel, W

Tel. +49 89 23399-8717



## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P010605WO CLM SZM	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/01468	International filing date ( <i>day/month/year</i> ) 23/02/2000	Priority date ( <i>day/month/year</i> ) 26/02/1999
International Patent Classification (IPC) or national classification and IPC C07K14/21		
Applicant SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand  28/08/2000	Date of completion of this report  17.07.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Barnas, C  Telephone No. +49 89 2399 7469 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/01468

**I. Basis of the report**

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-61 as originally filed

Claims, No.:

1-14, 15 (part), 23, 24 as originally filed

15 (part), 16-22 as received on 03/07/2001 with letter of 03/07/2001

Drawings, sheets:

1-20 as originally filed

Sequence listing part of the description, pages:

1-7, as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.  
☒ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/01468

- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description,      pages:  
☐ the claims,      Nos.:  
☐ the drawings,      sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:  
**see separate sheet**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims 1-24
	No: Claims
Inventive step (IS)	Yes: Claims 1-24
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-24
	No: Claims

2. Citations and explanations  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

D1: WO 98 28333 A (COPE LESLIE D ;HANSEN ERIC J (US); AEBI CHRISTOPH (US); FISKE MICH) 2 July 1998 (1998-07-02)

SEQ ID NOs. 2 and 4 are not known from the cited prior art. The subject matter of claims 1-24 which is connected with said sequences is, therefore, new.

For examination of the present set of claims for inventiveness, D1 can be taken as closest prior art. Said document discloses two proteins from *Moraxella Catarrhalis* and their encoding nucleic acids. The difference between D1 and the present application is, therefore, the isolation of a further protein characterised by SEQ ID NOs: 2 and 4 from said organism. The cited prior art does not provide any indication that would prompt the skilled person to isolate said proteins. Said proteins and the subject matter of claims 1-24 which is connected with said proteins is, therefore, inventive.

**Re Item VIII**

**Certain observations on the international application**

**Art. 6 PCT, Lack of Conciseness**

Claims 1-4 and 6-12 unduly repeat the same wording. Claims which contain all the features of any other claim and, therefore, represent dependent claims (Rule 6.4 PCT) are not formulated as such. Claims 1-4 and 6-12 are, therefore not concise.



BM45378

sufficient for the production of said polypeptide and recovering the polypeptide from the culture medium.

16. A process for expressing a polynucleotide of any one of claims 6 – 12 comprising transforming a host cell with the expression vector comprising at least one of said polynucleotides and culturing said host cell under conditions sufficient for expression of any one of said polynucleotides.

17. A vaccine composition comprising an effective amount of the polypeptide of any one of claims 1 to 5 and a pharmaceutically acceptable carrier.

18. A vaccine composition comprising an effective amount of the polynucleotide of any one of claims 6 to 12 and a pharmaceutically effective carrier.

19. The vaccine composition according to either one of claims 17 or 18 wherein said composition comprises at least one other *Moraxella catarrhalis* antigen.

20. An isolated antibody immunospecific for the polypeptide or immunological fragment as claimed in claim 4.

21. A method of diagnosing a *Moraxella catarrhalis* infection, comprising identifying a polypeptide as claimed in any one of claims 1 - 5, or an antibody that is immunospecific for said polypeptide, present within a biological sample from an animal suspected of having such an infection.

22. Use of a composition comprising an immunologically effective amount of a polypeptide as claimed in any one of claims 1 – 5 in the preparation of a medicament for use in generating an immune response in an animal.

# INTERNATIONAL COOPERATION TREATY

## PCT

### NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 02 October 2000 (02.10.00)	<b>Applicant's or agent's file reference</b> FB/BM45378
<b>International application No.</b> PCT/EP00/01468	<b>Priority date (day/month/year)</b> 26 February 1999 (26.02.99)
<b>International filing date (day/month/year)</b> 23 February 2000 (23.02.00)	<b>Applicant</b> RUELE, Jean-Louis

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
28 August 2000 (28.08.00)

☐ in a notice effecting later election filed with the International Bureau on:  
\_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b>  S. Mafia  Telephone No.: (41-22) 338.83.38
---	---

BEST AVAILABLE COPY

Copy for the designated Office (FR ' US)

PCT/EP00/01468

PATENT COOPERATION TREATY

9/914

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

COTTER, Ivan, John  
D Young & Co.  
New Fetter Lane  
London EC4A 1DA  
ROYAUME-UNI

Date of mailing (day/month/year) 02 February 2002 (02.02.02)	
Applicant's or agent's file reference FB/BM45378	IMPORTANT NOTIFICATION
International application No. PCT/EP00/01468	International filing date (day/month/year) 23 February 2000 (23.02.00)
International publication date (day/month/year) 08 September 2000 (08.09.00)	Priority date (day/month/year) 26 February 1999 (26.02.99)
Applicant SMITHKLINE BEECHAM BIOLOGICALS S.A. et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
26 Febr 1999 (26.02.99)	9904559.3	GB	10 Janu 2002 (10.01.02) *

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer Dorothee MÜLHAUSEN Telephone No. (41-22) 338.83.38
--	---

# PATENT COOPERATION TREATY

PCT/EP

PCT

## NOTIFICATION CONCERNING DOCUMENT TRANSMITTED

From the INTERNATIONAL BUREAU

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as designated Office

Date of mailing (day/month/year)  
02 February 2002 (02.02.02)

International application No.  
PCT/EP00/01468

International filing date (day/month/year)  
23 February 2000 (23.02.00)

Applicant

SMITHKLINE BEECHAM BIOLOGICALS S.A. et al

The International Bureau transmits herewith the following documents and number thereof:

\_\_\_\_\_ cop(ies) of priority document(s) (Rule 17.2(a))

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Form PCT/IB/310 (July 1992)

Authorized officer

Dorothee MÜLHAUSEN

Telephone No.: (41-22) 338.83.38

004637033

## TENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>FB/BM45378</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 00/01468</b>	International filing date (day/month/year) <b>23/02/2000</b>	(Earliest) Priority Date (day/month/year) <b>26/02/1999</b>
Applicant <b>SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☒ contained in the international application in written form.
- ☒ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).
3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established by this Authority to read as follows:
- IMMUNOGENIC COMPOUNDS**

5. With regard to the **abstract**,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.
- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/01468

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Line 1 after "popypeptides" add "from moraxella catarrhalis"